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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,232	12/13/2001	Michael Charles LaCroix	104427-100	1610

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SAND & SEBOLT
AEGIS TOWER, SUITE 1100
4940 MUNSON STREET, NW
CANTON, OH 44718-3615

EXAMINER	
MILLER, PATRICK L	
ART UNIT	**PAPER NUMBER**
2837	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/017,232	LACROIX, MICHAEL CHARLES	
	Examiner	Art Unit	
	Patrick Miller	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02112005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the description on page 7, lines 18-26 as described in the specification (see bullet below). Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

   - The specification states that CLP is the voltage across the motor, which is then filtered (page 7, ll. 21-22). Additionally, the output of the low pass filter is connected via a resistor to the input of the error amplifier OPA3 14 (page 7, ll. 22-24). Based on Figure

1, it is unclear how CLP is low pass filtered and where the output of the filtered signal connects to OPA3 14.

Claim Objections

2. Claim 18 is objected to because of the following informalities: see bullet(s) below. Appropriate correction is required.

- Claim 18 recites, "a closed loop feedback loop" (l. 10). It is unclear if this loop is the same as that recited in line 4. If so, change "a" to "said."
- Claim 18 recites, "a signal" (l. 11). It is unclear if this signal is the same as recited in line 3. If so, please change "a" to "said."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrazzini et al. (6,693,400), Sato et al. (5,315,458) and Eroglu et al. (2002/0084758).

- With respect to claim 1, Pedrazzini et al. discloses an electric motor controller, comprising: a digital to analog converter means for setting voltage across a motor (Fig. 4, #34 controls #32 to set the voltage across the motor); a control circuit for converting a duty cycle of an input signal for output to the digital to analog converter means (Fig. 4, #64 converts the duty cycle of the ADCIN signal and outputs it to #46 along with the

output of #48); and a closed loop feedback loop means for monitoring and setting the voltage across the motor (Fig. 4, measured voltage input to #32 at VSN and VSP).

- Pedrazzini et al. does not disclose an 8-bit DAC, a state machine, and does not explicitly disclose setting a voltage across a motor.
- Sato et al. discloses driving a motor where a signal is converted to an analog voltage signal, amplified, and sent to drive the motor as the voltage across the motor (col. 6, ll. 9-17; Fig. 8, output of #80 is a voltage signal; voltage signal amplified by #82 and sent directly to the motor). The motivation to use a voltage signal is because this signal is used with a power amplifier.
- Eroglu et al. discloses a microprocessor (controller logic circuit) and associated memory that controls a state machine (Fig. 2, #s 26 and 27). Additionally, Eroglu et al. teaches that a portion of a motor control circuit can be implemented using a state machine (para. [0045]). The motivation to use implement a state machine to replace a portion of the motor control circuitry is so that portion can be implemented in hardware (para. [0045], since general disclosure of a state machine, this implies the state machine could be digital).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that the amplifier of Pedrazzini et al. would output a voltage signal to set the voltage across the motor based on the teachings of Sato et al. This would provide the advantage of allowing a circuit designer the ability of using a power amplifier to amplify the voltage signal, as taught by Sato et al. Additionally, it would have been obvious to one having ordinary skill in the art at the time of the invention that the controller chip and

driver chip of Pedrazzini et al. could be replaced by a microcomputer (including memory) and state machine, thus making the state machine set the voltage across the motor, which would provide the advantage of allowing the circuitry to be implemented in hardware, as taught by Eroglu et al. Finally, with respect to the 8-bit feature, the examiner takes Official Notice. Pedrazzini et al. discloses a DAC (Fig. 4, #46) but does not disclose its resolution capabilities. It would have been obvious to one having ordinary skill in the art at the time of the invention that the DAC of Pedrazzini et al. would be and 8-bit DAC. The motivation to use an 8-bit DAC is because it provides better resolution than would lower bit DAC.

- With respect to claims 10 and 11, Pedrazzini et al. disclose the system comprising a component/electric motor (Fig. 4, #28).

4. Claims 2, 3, 10, 12, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrazzini et al., Sato et al., and Eroglu et al. as applied to claim 1 above, and further in view of Maxwell, Jr. et al. (6,816,758).

- Pedrazzini et al., Sato et al., and Eroglu et al. do not disclose an over-current sense circuit (claims 2 and 13), an over/under voltage sense circuit (claims 3 and 14), and a component being an electric light (claims 10 and 12).
- Maxwell, Jr. et al. discloses a controller for a load that has both an over-current sense circuit and an over/under voltage sense circuit (Fig. 2, #s 32 and 30). The motivation to use an over-current sense circuit and an over/under voltage sense circuit is to protect the motor (col. 9, ll. 39-55). Additionally, with respect to claims 10 and 12, first note that for claim 10, the examiner has redefined "a component." Here, Maxwell, Jr. teaches that a

controller can be used with many loads (components). Furthermore, Maxwell, Jr. states that the system is used to power one or more electrical components in airplanes and automobiles, including electric motors and servos, and various other electrical systems (cols. 6/7, ll. 65-67/1-42). Because Maxwell, Jr. discloses using a controller system to control various electrical systems in airplanes and automobiles, it would have been obvious to one having ordinary skill in the art at the time of the invention that the Maxwell, Jr. disclosure includes lighting systems in airplanes and automobiles, which would include an electric light.

- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement into the circuit of Pedrazzini et al., an over-current sense circuit and an over/under voltage sense circuit, thereby providing the advantage of protecting the load from damage due to excessive current and/or voltage, as taught by Maxwell, Jr. et al. Additionally, it would have been obvious to one having ordinary skill in the art at the time of the invention that the system of Pedrazzini et al. could be used to control either a motor and a light system because Maxwell, Jr. teaches that controllers may be used to control multiple systems within airplanes and automobiles, including an electric light in a lighting system.

5. Claims 4, 5, 6, 7, 9, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrazzini et al. (6,693,400), Sato et al. (5,315,458) and Eroglu et al. (2002/0084758).

- With respect to claim 4, Pedrazzini et al. disclose a circuit arrangement for an electric motor controller, comprising: a controller logic circuit that controls a driver circuit to set the voltage across an electric motor (Fig. 4, #34 controls #32 to set the voltage across the

motor); and a closed loop feedback circuit for generating a signal indicating the voltage across the electric motor, the signal being input to the driver circuit for monitoring (Fig. 4, measured voltage input to #32 at VSN and VSP).

- With respect to claim 15, Pedrazzini et al. discloses a system for controlling the speed of an electric motor, comprising: a digital to analog converter means for setting a voltage across the electric motor (Fig. 4, #46); a controller that generates the digital signal (Fig. 4, output of #48 is a digital signal; Fig. 12A, #78; see also col. 4, ll. 44-48; where instructions from software implies memory) to control a driver circuit for converting the duty cycle of an input signal (Fig. 4, #38 converts the duty cycle of the input signal PSMA to control the output signal OUTA; see also col. 3, ll. 17-19; PSM has a duty cycle), and where the driver circuit sets the voltage supplied to the electric motor (Fig. 4, #38 sets the voltage to #28); and a closed loop feedback means that monitors the voltage across the motor and generates a signal for input to the micro-controller (Fig. 4, measured voltage input to #32 at VSN and VSP).
- With respect to claims 4 and 15, Pedrazzini et al. does not disclose a microprocessor, a state machine, and does not explicitly disclose setting a voltage across the motor.
- Sato et al. discloses driving a motor where a signal is converted to an analog voltage signal, amplified, and sent to drive the motor as the voltage across the motor (col. 6, ll. 9-17; Fig. 8, output of #80 is a voltage signal; voltage signal amplified by #82 and sent directly to the motor). The motivation to use a voltage signal is because this signal is used with a power amplifier.

- With respect to claims 7 and 15, Eroglu et al. discloses a microprocessor (controller logic circuit) and associated memory that controls a state machine (Fig. 2, #s 26 and 27). Additionally, Eroglu et al. teaches that a portion of a motor control circuit can be implemented using a state machine (para. [0045], since general disclosure of a state machine, this implies the state machine could be digital). The motivation to use implement a state machine to replace a portion of the motor control circuitry is so that portion can be implemented in hardware (para. [0045]).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that the amplifier of Pedrazzini et al. would output a voltage signal to set the voltage across the motor based on the teachings of Sato et al. This would provide the advantage of allowing a circuit designer the ability of using a power amplifier to amplify the voltage signal, as taught by Sato et al. Additionally, it would have been obvious to one having ordinary skill in the art at the time of the invention that the controller chip and driver chip of Pedrazzini et al. could be replaced by a microcomputer (including memory) and state machine, thus making the state machine set the voltage across the motor, which would provide the advantage of allowing the circuitry to be implemented in hardware, as taught by Eroglu et al.
- With respect to claim 5, since Eroglu et al. disclose implementing a state machine, the state machine controls the spin-up routine, which is interpreted as a running state (para. [0045]).

- With respect to claim 6, since Eroglu et al. teaches replacing portions of a control circuit for a motor with a state machine, this means that the state machine has a lockout state (Fig. 3, #35 and subsequent steps).
- With respect to claim 9, Pedrazzini et al. disclose the circuit arrangement being directly coupled to the electric motor (Fig. 4, #28 to circuit arrangement #s 34, 32, R1, R2, R3, C3).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrazzini et al. (6,693,400), Sato et al. (5,315,458), and Eroglu et al. (2002/0084758) as applied to claim 4 above.
   - Pedrazzini et al., Sato et al., and Eroglu et al. do not disclose an 8-bit DAC.
   - With respect to this feature, the examiner takes Official Notice. Pedrazzini et al. discloses a DAC (Fig. 4, #46) but does not disclose its resolution capabilities. It would have been obvious to one having ordinary skill in the art at the time of the invention that the DAC of Pedrazzini et al. would be and 8-bit DAC. The motivation to use an 8-bit DAC is because it provides better resolution than would lower bit DAC.
7. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrazzini et al. (6,693,400), Sato et al. (5,315,458) and Eroglu et al. (2002/0084758) as applied to claim 15 above.
   - Eroglu et al. discloses a control device used with CD ROM drives, but Eroglu et al., Pedrazzini et al., and Sato et al. do not disclose an automobile comprising the system of claim 15.

- With respect to this feature, the examiner takes Official Notice. Eroglu et al. disclose a system that controls CD ROM drivers. It would have been obvious to one having ordinary skill in the art at the time of the invention that the system of Pedrazzini et al., Sato et al., and Eroglu et al., can be used in an automobile because automobiles are equipped with CD ROM drivers so passengers can watch for instance movies.
- With respect to claim 17, Pedrazzini et al. disclose the system being a temperature control system (col. 4, ll. 57-59).

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrazzini et al. (6,693,400), Sato et al. (5,315,458), Eroglu et al. (2002/0084758), and Maxwell, Jr. et al. (6,816,758).
   - With respect to claim 18, Pedrazzini et al. discloses a controller for an electric motor, comprising: a driver circuit for converting the duty cycle of an input signal generated by an associated closed loop feedback loop (Fig. 4, #38 converts the duty cycle of the input signal PSMA to control the output signal OUTA; see also col. 3, ll. 17-19; PSM has a duty cycle; associated with feedback from ADCIN and C3 and R3); a digital to analog converter for setting voltage across the electric motor (Fig. 4, #46 sets voltage across #28); and the closed loop feedback further monitors the voltage across the motor and generates the input signal to the digital state machine (Fig. 4, measured voltage input to #32 at VSN and VSP).
   - Pedrazzini et al. does not disclose a state machine, an over-current sense circuit, over/under voltage sense circuit, an 8-bit DAC, and does not explicitly disclose setting a voltage across the motor.

- Sato et al. discloses driving a motor where a signal is converted to an analog voltage signal, amplified, and sent to drive the motor as the voltage across the motor (col. 6, ll. 9-17; Fig. 8, output of #80 is a voltage signal; voltage signal amplified by #82 and sent directly to the motor). The motivation to use a voltage signal is because this signal is used with a power amplifier.
- Eroglu et al. discloses a microprocessor (controller logic circuit) and associated memory that controls a state machine (Fig. 2, #s 26 and 27). Additionally, Eroglu et al. teaches that a portion of a motor control circuit can be implemented using a state machine (para. [0045], since general disclosure of a state machine, this implies the state machine could be digital). The motivation to use implement a state machine to replace a portion of the motor control circuitry is so that portion can be implemented in hardware (para. [0045]).
- Maxwell, Jr. et al. discloses a controller for a load that has both an over-current sense circuit and an over/under voltage sense circuit (Fig. 2, #s 32 and 30). The motivation to use an over-current sense circuit and an over/under voltage sense circuit is to protect the motor (col. 9, ll. 39-55).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that the amplifier of Pedrazzini et al. would output a voltage signal to set the voltage across the motor based on the teachings of Sato et al. This would provide the advantage of allowing a circuit designer the ability of using a power amplifier to amplify the voltage signal, as taught by Sato et al. Additionally, it would have been obvious to one having ordinary skill in the art at the time of the invention that the controller chip and driver chip of Pedrazzini et al. could be replaced by a microcomputer (including memory)

and state machine, thus making the state machine set the voltage across the motor, which would provide the advantage of allowing the circuitry to be implemented in hardware, as taught by Eroglu et al. Also, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement into the circuit of Pedrazzini et al., an over-current sense circuit and an over/under voltage sense circuit, thereby providing the advantage of protecting the load from damage due to excessive current and/or voltage, as taught by Maxwell, Jr. et al. Finally, With respect to the 8-bit DAC, the examiner takes Official Notice. Pedrazzini et al. discloses a DAC (Fig. 4, #46) but does not disclose its resolution capabilities. It would have been obvious to one having ordinary skill in the art at the time of the invention that the DAC of Pedrazzini et al. would be and 8-bit DAC. The motivation to use an 8-bit DAC is because it provides better resolution than would lower bit DAC.

Prior Art

9. Mazda (6,140,784) disclose an H-bridge driver that controls the direction of current to the VCM and the magnitude of voltage across the VCM.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 41. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Miller
Examiner
Art Unit 2837

pm
July 5, 2005

MARLON T. FLETCHER
PRIMARY EXAMINER